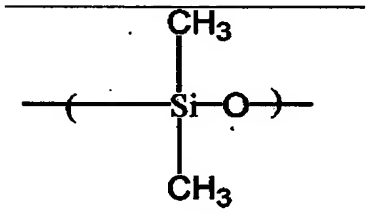
WHAT IS CLAIMED IS:

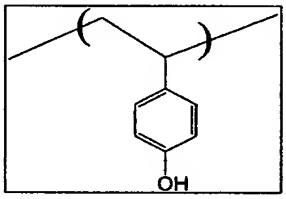
1. An organic anti-reflective coating composition comprising: a cross-linking agent; a light-absorbing agent having a high light-absorbency within a wavelength range of an exposure light source; a thermal acid generator; an organic solvent; and a polydimethylsiloxane polymer having a structure in accordance with formula 1.

(Formula 1)



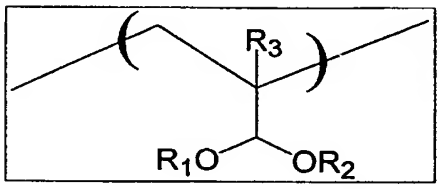
2. The composition according to claim 1, wherein the light-absorbing agent comprises a polyvinyl phenol polymer having a structure in accordance with formula 2.

(Formula 2)



3. The composition according to claim 1, wherein the cross-linking agent comprises a polymer having a weight average molecular weight ranging from about 3000 grams per mol (g/mol) to about 100,000 g/mol and a structure in accordance with formula 3.

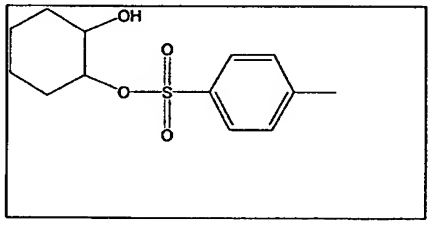
(Formula 3)



wherein R_1 and R_2 are each independently a C_1-C_{10} alkyl group, straight chain or branched; and R_3 is a hydrogen or methyl group.

4. The composition according to claim 1, wherein the thermal acid generator comprises 2-hydroxycyclohexyl p-toluenesulfonate having a structure in accordance with formula 4.

(Formula 4)



5. The composition according to claim 2, wherein the polyvinyl phenol polymer is contained in an amount of about 50 weight percent (wt.%) to about 400 wt.%, based on the amount of the cross-linking agent.

6. The composition according to claim 4, wherein the thermal acid generator is contained in an amount of about 10

wt.% to about 200 wt.%, based on the amount of the cross-linking agent.

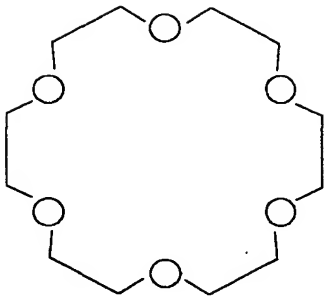
7. The composition according to claim 1, wherein the organic solvent is contained in an amount of about 1000 wt.% to about 10,000 wt.%, based on the total amount of the cross-linking agent and the light-absorbing agent.

8. The composition according to claim 1, wherein the polydimethylsiloxane polymer is contained in an amount of about 20 wt.% to about 100 wt.%, based on the total amount of the cross-linking agent and the light-absorbing agent.

9. The composition according to claim 1, further comprising an acid-diffusion inhibitor.

10. The composition according to claim 9, wherein the acid diffusion inhibitor comprises (18-crown-6(1, 4, 7, 10, 13, 16-hexaoxacyclooctadecane) having a structure in accordance with formula 5;

(Formula 5)



11. The composition according to claim 9, wherein the molar ratio of acid-diffusion inhibitor to thermal acid generator is between about 0.30 and about 5.0.

12. A method for forming a photoresist pattern comprising the steps of:

applying an organic anti-reflective coating composition comprising a cross-linking agent, a light-absorbing agent having a high absorbency within a wavelength range of an exposure light source, a thermal acid generator, an organic solvent, and a polydimethylsiloxane polymer onto the surface of a layer to be etched, to form a coating;

conducting a baking process on the coating to generate cross-linking therein and form an organic anti-reflective film;

applying a photosensitive material onto the anti-reflective film to form a photoresist;

exposing the photoresist to a light source to form an exposed photoresist, and,

developing the exposed photoresist to form the photoresist pattern.

13. The method according to claim 12, wherein the baking process is performed between about 150°C and about 300°C for between about 1 minute and about 5 minutes.

14. The method according to claim 12, further comprising an additional baking process before or after the step of exposing the photoresist to a light source.

15. The method according to claim 14, wherein the baking process is performed between about 70°C and about 200° C.

16. The method according to claim 12, wherein a microfine photoresist pattern is formed and the light source is selected from the group consisting of F_2, ArF, KrF, deep-ultraviolet including extreme ultraviolet, electron beam, X-ray, and ion beam.

17. A semiconductor device manufactured by the method of claim 12.